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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/871,488

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Young Joo Yee

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8736

35884

7590

08/21/2006

LEE, HONG, DEGERMAN, KANG & SCHMADEKA
801 S. FIGUEROA STREET
12TH FLOOR
LOS ANGELES, CA 90017

EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT

PAPER NUMBER

2627

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/871,488	Applicant(s) YEE, YOUNG JOO	
	Examiner P. Agustin	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2006.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-16, 18, 20 and 21 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 13-16, 18, 20 and 21 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 13-16, 18, 20 & 21 are now pending.

Claim Objections

2. Claim 20 is objected to because it is improperly dependent on claim 19, which has been canceled.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 13, 18 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. (US 6,044,041) in view of Mandella (US 6,181,478).

In regard to claim 13, Ishizaki et al. disclose an optical pickup head (Figure 4, elements 69, 71 & 72) which makes a fine movement by a driver, and focuses an incident laser beam to a recording medium for recording/reproducing a data, the optical pickup head (Figure 4, elements 69, 71 & 72) comprising: a single micro mirror (69) having at least one approximately 45° mirror surface (note that a 45° mirror surface is necessary to reflect a beam from element 70 to the medium 51 in a perpendicular direction) for reflecting the incident laser beam perpendicular to an incident direction such that only one micro mirror is mounted in the optical head; a focusing lens (71) under the micro mirror for primary focusing of the laser beam reflected at the micro mirror; an SIL (Solid Immersion Lens) (72) under the focusing lens for secondary focusing of the laser beam focused by the focusing lens; a supporting frame (inherent structure that holds

Art Unit: 2627

elements 69, 71 & 72 together) for integrating the micro mirror, the focusing lens and the SIL (Solid Immersion Lens) such that the micro mirror, focusing lens and SIL are held stationary with respect to each other and movement of the supporting frame is controllable by a single driver (not shown, inherent mechanism that drives the SWING ARM of Figure 4); and an air-bearing surface (space between elements 51 & 72) formed under the supporting frame for making the supporting frame buoyant (suggested by “head floating slider” on column 8, line 33; and “floating-type” on column 8, line 43), wherein the supporting frame comprises a first opening (inherent hole where 71 is mounted) for supporting the focusing lens, and a second opening (inherent hole where 72 is mounted) for supporting the SIL.

In regard to claim 18, Ishizaki et al. disclose that the 45° mirror surface of the micro-mirror, a focus plane of the focusing lens, and a focus plane of the SIL are aligned in parallel (as shown by Figure 4, elements 69, 71 & 72).

However, Ishizaki et al. do not explicitly disclose: in regard to claim 13, that the first opening has a side surface sloped at a fixed angle such that an upper width of the first opening is greater than a lower width of the first opening; and in regard to claim 20, that the second opening has a side surface at a fixed angle such that an upper width of the second opening is greater than a lower width of the second opening.

Mandella, in the optical recording art (see last three lines of abstract), discloses an opening (see Figure 3B) having a side surface (62) sloped at a fixed angle such that an upper width of the opening is greater than a lower width of the opening. It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have provided the sloped opening of Mandella to the supporting frame of Ishizaki et al., the motivation being to

Art Unit: 2627

provide an optical system having a small size, and to eliminate misalignment problems (column 2, lines 57-65).

5. Claims 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al. & Mandella as applied to claim 13 above, and further in view of Jerman et al. (US 6,061,323).

For a description of Ishizaki et al. & Mandella, see the rejection above. However, Ishizaki et al. & Mandella do not explicitly disclose: in regard to claim 14, that the 45° mirror surface of the micro mirror has a highly reflective metal coating applied thereto; and in regard to claim 15, that the micro mirror is formed of a silicon substrate.

Jerman et al. disclose a mirror surface having a highly reflective metal coating applied thereto, and formed of a silicon substrate (column 16, lines 53-56).

It would have been obvious to one of ordinary skill in the art at the time of the invention by the Applicant to have provided the highly reflective metal coating of Jerman et al. to the mirror surface of Ishizaki et al. & Mandell, the motivation being to provide a micro-mirror with an improved stiffness/mass ratio for lower mirror distortion, and improved combinations of maximum mirror angular displacement, operating voltage range, mirror stiffness, mirror flatness and resonant frequency (column 3, lines 46-56).

It would have been obvious to one of ordinary skill in the art at the time of the invention by the Applicant to have formed the micro mirror of Ishizaki et al. & Mandella with a silicon substrate as suggested by Jerman et al., the motivation being to provide a mechanically-rigid micro mirror (a well-known advantage of silicon, see Wilde et al. (US 6,044,056), column 8, lines 16-17).

6. Claims 16 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki et al., Mandella & Jerman et al. as applied to claim 15 above, and further in view of Ohashi et al. (US 6,487,224).

For a description of Ishizaki et al., Mandella & Jerman et al., see the rejection above. However, Ishizaki et al., Mandella & Jerman et al. do not explicitly disclose: in regard to claim 16, that the silicon substrate is a 9.74° off-axis silicon wafer; and in regard to claim 21, that the size of the micro mirror is determined by a pattern size of a front etch mask thin film and a thickness of the off-axis silicon wafer during a photolithography semiconductor fabrication process.

Ohashi et al. disclose a 9.74° off-axis silicon wafer substrate (column 1, lines 34-56) wherein the size of a micro mirror is determined by a pattern size of a front etch mask thin film and a thickness of the off-axis silicon wafer during a photolithography semiconductor fabrication process (understood from the discussion on column 1, lines 42-60).

It would have been obvious to one of ordinary skill in the art at the time of the invention by the Applicant to have used the 9.74° off-axis silicon wafer of Ohashi et al. for the silicon substrate of Ishizaki et al., Mandella & Jerman et al., the motivation being to reduce the number of parts.

Response to Arguments

7. Applicant's arguments filed July 27, 2006 have been fully considered but they are not persuasive.

a. The Applicant argues on page 4, last paragraph that Ishizaki does not disclose a supporting frame for integrating each component of an optical pickup head. The

Examiner disagrees. Note that elements 69, 71 & 72 are all mounted on a common movable optical system P2 (see Figure 4). The claimed “supporting frame” is read to correspond to the inherent structure that holds elements 69, 71 & 72 together (see Figure 4). Alternatively, the claimed “supporting frame” can be read to correspond to the combination of each element that holds the mirror 69, the focusing lens 71, and the SIL 72.

b. In response to Applicant’s arguments on page 5, paragraphs 1-3 regarding the added features of claim 13, the 102(b) rejection under Ishizaki et al. has been withdrawn. However, as indicated above, claim 13 is now rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishizaki et al. in view of Mandella.

c. In response to Applicant’s arguments on page 6, last paragraph thru page 7 that Mandella fails to disclose a supporting frame with a first opening having a side surface sloped at a fixed angle for supporting the focusing lens, and a second opening for supporting the SIL, it is noted that the Applicant is attacking references individually where the rejections are based on a combination of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, the Ishizaki et al. reference was relied upon to teach a supporting frame comprising a first opening for supporting the focusing lens, and a second opening for supporting the SIL. The Examiner conceded that Ishizaki et al. do not explicitly disclose that the first opening has a side surface sloped at a fixed angle such that an upper width of the first opening is greater than a lower width of the first opening. The Mandella reference was relied upon to teach only this missing feature.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to P. Agustin whose telephone number is 571-272-7567. The examiner can normally be reached on Monday-Friday 9:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 2627

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P. Agustin
Art Unit 2627


ANDREA WELLINGTON
SUPERVISORY PATENT EXAMINER